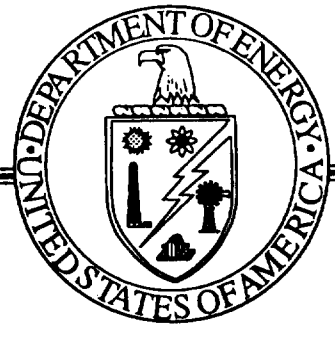
APPENDIX H

FIELD VERIFICATION REPORT
IDAHO NATIONAL ENGINEERING LABORATORY
MAY 2 – 10, 1994



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EXECUTIVE SUMMARY

This report presents the results of a review of chemical safety vulnerabilities associated with facilities owned or operated by the Department of Energy (DOE) at the Idaho National Engineering Laboratory (INEL) from May 2 to May 10, 1994. The INEL review was part of the Chemical Safety Vulnerability Review being conducted by the Office of Environment, Safety and Health at the direction of the Secretary of Energy. The purpose of the review is to identify and characterize conditions or circumstances involving potentially hazardous chemicals at DOE facilities. Specifically, the review is designed to identify, characterize, and prioritize chemical safety vulnerabilities that might result in (1) fires or explosions from uncontrolled chemical reactions, (2) exposure of workers or the public to chemicals, or (3) releases of chemicals to the environment.

Ongoing activities involving hazardous chemicals at the INEL include the varied use, handling, transportation, retention, and disposal of hazardous chemicals primarily related to storage, conditioning for final disposition, and processing of spent fuel and other radioactive materials; reactor research and development functions; environmental restoration and waste management; maintenance functions; and analytical laboratory activities. During the field verification review, team members reviewed those facilities included in the INEL self-evaluation effort (i.e., CPP-601/602/621 Fuel Processing Facility, Idaho Chemical Processing Plant [ICPP] Tank Farm, Pad A at the Radioactive Waste Management Complex, Pit 9 at the Radioactive Waste Management Complex, Army Reentry Vehicle Facility Site Sodium-Potassium Waste Storage Unit, Power Burst Facility Reactor Area Evaporation Pond, and Argonne National Laboratory–West [ANL-W] Analytical Laboratory). In addition, the Fluorinel Dissolution Process and Fuel Storage (FAST) Facility, the Waste Calcining Facility, and the Rover Headend Processing Plant at the ICPP; the Radioactive Sodium Storage Facility and Radioactive Scrap and Waste Facility at ANL-W; and selected emergency response facilities were examined by the review team. Although the field verification review involved examination of the ANL-W site, it did not specifically address the recent chlorine leak at ANL-W. Examination and evaluation of the circumstances surrounding that incident are the subject of an ongoing Type A Accident Investigation.

The INEL continues to face significant chemical hazards associated with its continuing operations, transition activities, and waste management and remediation activities. However, based on the facilities reviewed in this field verification, those hazards are generally well understood. Strong management systems and programs are in place to minimize or mitigate those hazards, and many commendable practices were documented. However, some weaknesses remain. Three vulnerabilities were identified as a result of the INEL field verification review. None of the identified vulnerabilities represent a condition or circumstance with the potential for severe near-term consequences.

- Spills and releases to the soil from past operations at the ICPP pose a hazard to workers involved in future activities that may disturb soils at the site (e.g., from construction or decontamination and decommissioning);

- Hazardous chemicals and wastes have been stored on site for excessive periods without a clear disposition plan; and

- Weaknesses in emergency management program documentation could influence the effectiveness of responses to hazardous material and releases.

Commendable practices related to chemical safety at the INEL include the following:

- The establishment of a sitewide chemical exchange system for excess chemicals;
- Successful efforts at the ICPP to eliminate inventory of bulk hazardous chemicals at facilities in transition;
- The planning, execution, and documentation for flushing chemical storage and processing systems at the FAST Facility and the Fuel Processing Facility;
- Maintenance and work control related to chemical systems at the ICPP;
- The replacement of aging safety systems at the ANL-W Analytical Laboratory;
- Use of the Waste Management Authority (committee) at the ICPP to review waste implications prior to changes in process or chemical use/purchase;
- A model chemical hygiene program for laboratory operations at the ANL-W Analytical Laboratory;
- The use of the Idaho Training Advisory Council to facilitate the exchange of information and improve consistency of training related to chemical safety across site contractors; and
- The development of a nomograph for use in planning response to chemical incidents at the ICPP.

The vulnerabilities identified at the INEL, along with those identified at other DOE sites during the field verification phase of the Chemical Safety Vulnerability Review, will be evaluated to determine DOE-wide generic vulnerabilities. Facility-specific and site-specific vulnerabilities are made available to the sites for use in developing management response plans which, in turn, will provide input to the DOE-wide management response plan.

1.0 INTRODUCTION

1.1 Purpose and Scope

Based on direction from the Secretary of Energy, the Assistant Secretary for Environment, Safety and Health established the Chemical Safety Vulnerability Working Group to review and identify chemical safety vulnerabilities within the Department of Energy (DOE). The Office of Environment, Safety and Health was designated to lead the review, with full participation from DOE line organizations having operational responsibilities. The information obtained from the review will provide the Working Group with valuable input for determining generic chemical safety vulnerabilities that face the DOE complex. Identifying and prioritizing generic chemical safety vulnerabilities will enhance the Department's focus on programs, funding, and policy decisions related to chemical safety.

The Chemical Safety Vulnerability Review was designed and undertaken to identify and characterize adverse conditions and circumstances involving potentially hazardous chemicals at facilities owned or operated by the Department. Specifically, the review was designed to identify, characterize, and prioritize chemical safety vulnerabilities associated with conditions or circumstances that might result in (1) fires or explosions from uncontrolled chemical reactions, (2) exposure of workers or the public to hazardous chemicals, or (3) release of hazardous chemicals to the environment. A project plan[1] was developed, using information from line organizations with operational responsibilities, to guide the review.

This report documents activities related to the field verification phase of the Chemical Safety Vulnerability Review. The field verification process was designed to use independent teams of technical professionals with experience in a variety of environment, safety, and health disciplines to verify the accuracy and completeness of the data compiled during the field self-evaluation phase of the review. This phase used a standardized question set developed and distributed by the Working Group to collect data related to chemical safety from 84 facilities located at 29 sites. Based on review of this input, nine sites, including the Idaho National Engineering Laboratory (INEL), were chosen to participate in the field verification phase of this review.

The review considered a broad range of facilities at the INEL (based on facility type and operational status), with special attention given to those facilities being transferred to, awaiting, or undergoing decontamination and decommissioning (D&D). Different types of chemical- and waste-handling facilities (i.e., laboratories; process facilities; and waste treatment, storage, and disposal facilities) were examined during the review to permit identification of vulnerabilities arising from hazardous chemicals and wastes at the INEL. Although this review involved examination of the Argonne National Laboratory–West (ANL-W) site, it did not specifically address the recent chlorine leak at ANL-W. Examination and evaluation of the circumstances surrounding that incident are the subject of an ongoing Type A Accident Investigation.

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[1] "Project Plan for the Chemical Safety Vulnerability Review," dated March 14, 1994.

The INEL field verification team, under the direction of a DOE team leader, was composed of DOE and contractor personnel with technical expertise in various aspects of chemical safety, including management, operations, training, chemical process safety, industrial hygiene, maintenance, environmental protection, and emergency management. A team composition list is provided in Attachment 1 of this appendix.

The team met with management or technical representatives from each of the facilities reviewed. Individual and small group meetings were also held, and team members conducted facility walkthroughs, document reviews, and personnel interviews to gather information related to potential chemical safety vulnerabilities at the INEL. The team leader met regularly with management to discuss the team's activities and any issues that may have surfaced during the previous day. Before the field verification team left the INEL site, management from local DOE and contractor organizations conducted a factual accuracy review of the draft document. An outbriefing was conducted for DOE and contractor management on Tuesday, May 10, 1994. A draft copy of this report was provided to DOE and contractor management.

1.2 Site Description

The INEL site consists of 890 square miles of desert in southeastern Idaho. Its borders are 32 miles west of Idaho Falls and 80 miles southwest of Yellowstone National Park (see Figure 1). The INEL site is 39 miles long from north to south and 36 miles wide at its broadest point (see Figure 2). It has an average elevation of 4,865 feet, underlaid with beds of basalt rock. The climate is semiarid, with an average precipitation level of 8.5 inches. The average temperature at the site is 42 °F, with extremes ranging from 103 °F to –49 °F. The entire INEL site is designated as a National Environmental Research Park. All lands within the site boundaries constitute a protected outdoor laboratory where scientists from DOE, other Federal and State agencies, universities, and private research foundations conduct ecological studies.

The INEL was established in 1949 as the National Reactor Testing Station and contains the largest concentration of nuclear reactors in the world. There are 53 research reactors at the INEL, of which 2 or 3 are typically in operation and roughly 15 more are operable at any point in time. Some landmark achievements of those test reactors are that they include the first nuclear reactor to generate a usable amount of electrical power, the world's first materials testing reactor, and the first experimental breeder reactor.

Contractor activities at the INEL are managed by the DOE Idaho Operations Office (ID), with the exception of ANL-W, which is managed by the DOE Chicago Operations Office through the Argonne Area Office–West (AAO-W). Four primary contractors conduct specific operations at areas around the site: University of Chicago; EG&G Idaho; Westinghouse Idaho Nuclear Company, Incorporated (WINCO); and Babcock & Wilcox (B&W). Two other contractors provide specific services: Protection Technology Idaho (PTI) is in charge of site security, and Morrison Knudsen-Ferguson of Idaho Company (MK-FIC) manages most construction at INEL. These contractors, plus DOE and other Federal agencies, employ more than 12,500 personnel at the INEL.

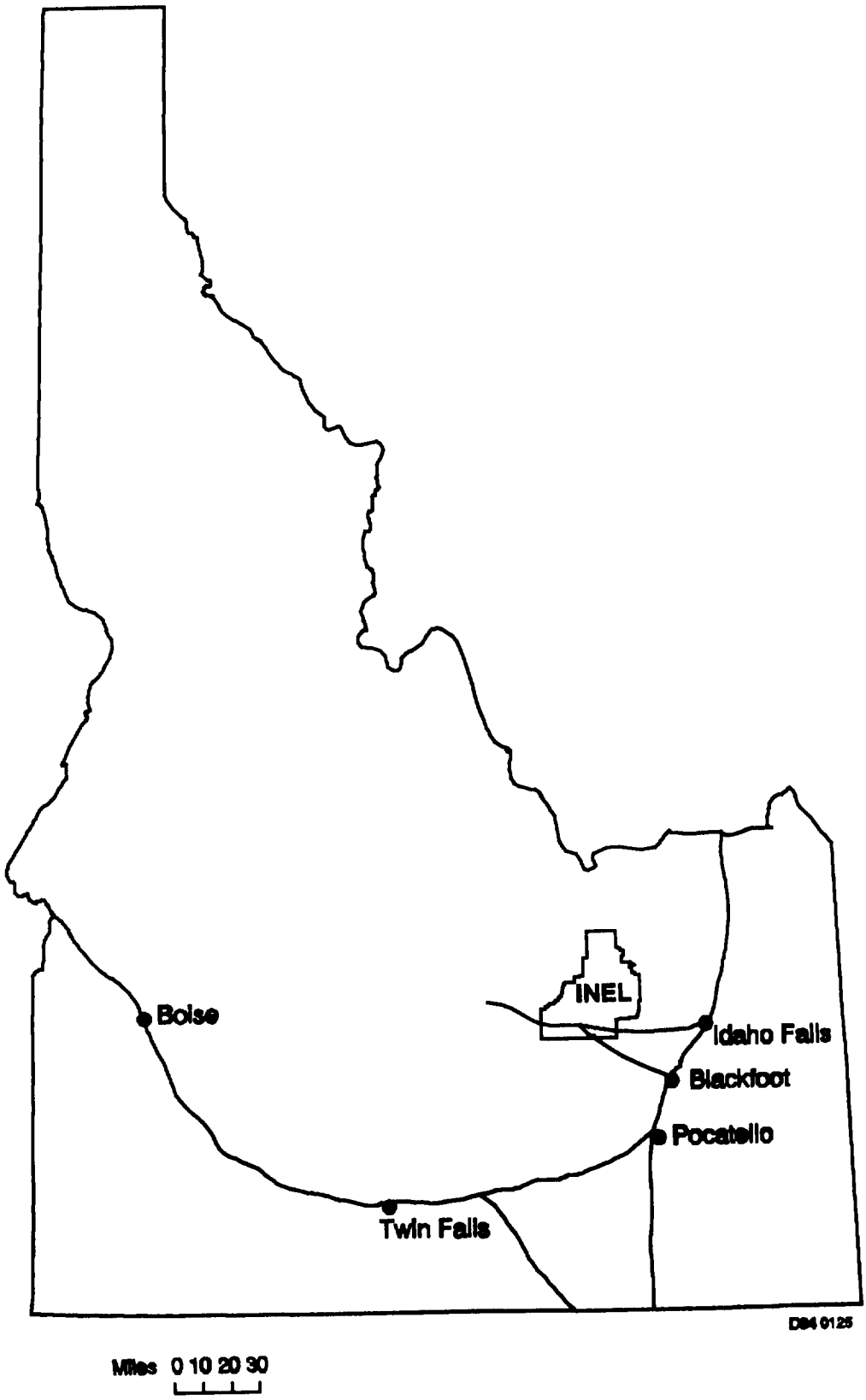

Figure 1. INEL Location.

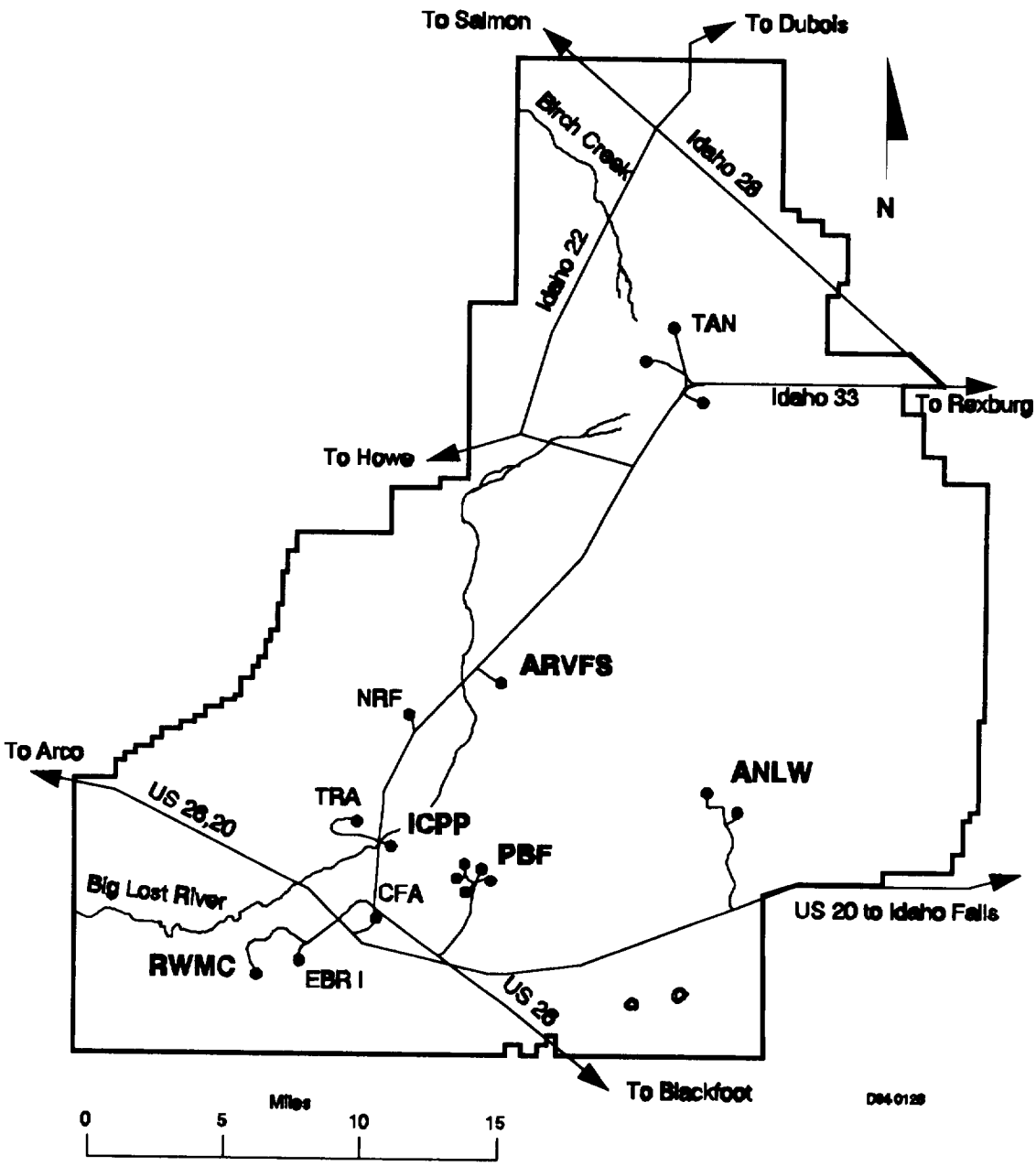

Figure 2. INEL Site.

ANL-W is located in the southeast corner of the site. The University of Chicago is the operating contractor at ANL-W. ANL-W is the nation's testing ground for liquid metal reactor technology. The complex includes the Experimental Breeder Reactor II (EBR-II), the first pool-type, liquid-metal-cooled reactor. In addition to demonstrating the feasibility of operating this kind of reactor, research has helped improve fuel and materials performance for future liquid metal reactors. EBR-II research has contributed to an innovative design for an advanced nuclear power plant, called the Integral Fast Reactor.

ANL-W has four other reactors and two fuel examination facilities. The Zero Power Physics Reactor provides reactor physics data for any type of fast neutron spectrum reactor. The Argonne Fast Source Reactor is used to calibrate instruments and to study fast reactor physics. The Transient Reactor Test Facility produces short, controlled bursts of nuclear energy to simulate accident conditions leading to fuel damage. The Neutron Radiography Facility is a nondestructive examination tool and a neutron source for isotope production, performing activation analysis and studying radiation effects on materials.

The Radioactive Waste Management Complex (RWMC), operated by EG&G Idaho, is located in the southwest corner of the site. Solid radioactive waste generated in national defense and research programs is stored or buried at the 144-acre RWMC site. Major activities at the RWMC include receipt and disposal of low-level radioactive waste; receipt, nondestructive examination, and interim storage of transuranic waste; support to environmental restoration program activities; and various engineering evaluations and demonstration projects. Transuranic wastes, primarily produced at other DOE facilities, are temporarily stored above ground for monitoring and eventual shipment to a Federal repository. The RWMC will be the site of several waste remediation technology applications to retrieve and process transuranic, mixed, and hazardous wastes that were buried in pits and trenches at the complex prior to 1970.

Located in the south-central INEL are four operation areas managed by two different contractors: the Central Facilities Area (CFA), the Power Burst Facility (PBF), and the Test Reactor Area (TRA) are operated by EG&G Idaho, and the Idaho Chemical Processing Plant (ICPP) is operated by WINCO.

The CFA serves as headquarters for many services for the entire INEL, including security, fire protection, medical facilities, communications systems, warehouses, a cafeteria, vehicle and equipment pools, and a bus system. The Radiological and Environmental Sciences Laboratory (RESL) operated by DOE is also at the CFA. RESL scientists monitor water, air, soil, and area farm produce to substantiate that the INEL operations are safe for site employees and the public. Monitoring results are reported quarterly to the U.S. Environmental Protection Agency, the State of Idaho, and site contractors.

For years, the PBF was a testing facility for nuclear fuels for commercial nuclear reactors. Because of its unique capabilities, the PBF is being considered for use in brain cancer treatment for a program called Boron Neutron Capture Therapy. The reactor is currently on standby.

The TRA, the world's most sophisticated materials testing complex, houses extensive facilities for studying the effects of radiation on materials, fuels, and equipment. The Advanced Test

Reactor (ATR) produces a neutron flux that allows simulation of long-duration radiation effects on materials and fuels. ATR also is used for production of important isotopes used in medicine, research, and industry. TRA has other smaller reactors, a hot-cell facility, and radiation measurements and radiochemistry laboratories. The ATR Critical Facility provides physics data in support of the ATR program. The Advanced Reactivity Measurement Facility and the Coupled Fast Reactivity Measurement Facility are small pool reactors that are operated at a maximum level of 100 kilowatts. These facilities provide irradiation services for research and materials testing.

The ICPP was constructed in the 1950s to reprocess spent Government-owned fuel from nuclear reactors. The facility is composed of multiple structures used to store irradiated fuels, dissolve spent fuels, extract recoverable uranium, and disposition residual acidic highly radioactive waste as calcine. During the 1980s, many ICPP facilities were replaced or upgraded. In April 1992, DOE decided to terminate fuel reprocessing at the ICPP and revised the mission to provide for (1) storing, conditioning for final disposal, and processing of spent fuel and other radioactive materials and (2) conducting research and development activities. Phaseout and deactivation of the facilities involved in fuel reprocessing are currently in progress. Spent fuel and radioactive waste are being managed on a long-term basis with daily monitoring of important system functions. The New Waste Calcining Facility, completed in 1982, is used to convert liquid radioactive waste to a granular solid form, achieving an eight-to-one volume reduction and producing a safe temporary storage form. Also at ICPP is the Remote Analytical Laboratory, one of the most sophisticated analytical laboratories in the world. This laboratory provides analytical support to ICPP functions.

At the northern end of the INEL is Test Area North (TAN), which consists of facilities for handling, storing, examining, and performing research and development work on spent nuclear fuel. This work is done in the TAN Hot Shop (operated by EG&G Idaho), the largest hot shop in the world, and in adjacent smaller hot cells. Manufacturing activities at TAN are conducted by B&W.

1.3 Facilities Visited

Visiting every DOE facility at INEL was not possible under the time constraints of this review. As a result, the field verification team focused its efforts to achieve the maximum results possible in the time available. Operations selected for field review focused on facilities examined in the INEL self-evaluation. These included the CPP-601/602/621 Fuel Processing Facility, the ICPP Tank Farm, Pad A at the RWMC, Pit 9 at the RWMC, the Army Reentry Vehicle Facility Site (ARVFS) Sodium-Potassium Storage Unit, the PBF Reactor Area Evaporation Pond, and the ANL-W Analytical Laboratory. In addition, other facilities were reviewed by the field verification team, including the Fluorinel Dissolution Process and Fuel Storage (FAST) Facility, the Waste Calcining Facility, and the Rover Headend Processing Plant at the ICPP; the Radioactive Sodium Storage Facility (RSSF) and the Radioactive Scrap and Waste Facility (RSWF) at ANL-W; and selected emergency response facilities. MK-FIC training activities were examined as part of the Human Resources Program functional area review; no B&W facilities or activities conducted by PTI were examined during this review.

The CPP-601/602 Fuel Processing Facility includes the CPP-601 Building, the CPP-602 Building, and the CPP-621 Area. The CPP-601 Building is the main ICPP

processing complex and is a rectangular structure about 240 feet long, 100 feet wide, and 90 feet high from lower subgrade level (60 feet below ground) to the rooftop. Principal process operations include nuclear fuel dissolution and liquid-to-liquid extraction purification. These operations are conducted in shielded cells within the CPP-601 Building. The process makeup area (i.e., upper level of the CPP-601 Building) supports in-cell operations. Due to the ICPP mission change, operations are being discontinued and systems are being flushed of residual material as part of the facility transition.

The CPP-602 Building is connected to the CPP-601 facility. The lower level of the CPP-602 Building houses the denitration process. The denitrator room measures about 12 feet long, 10 feet wide, and 14 feet high. The CPP-602 Building also contains the LC-106 storage vault, which is used for storage of special nuclear materials and measures 10 feet wide, 44 feet long, and 14 feet high, and Z-Cell, which is used for storage of uranium solution awaiting feed to the denitrator and measures 6 feet wide, 24 feet long, and 21 feet high. Also located in this building are various chemical laboratories and associated support areas, including offices.

CPP-621 is the Chemical Storage Area and contains a pumphouse, two bulk nitric acid vessels with capacities of 30,000 gallons and 18,400 gallons, and two bulk aluminum nitrate vessels with capacities of 16,000 gallons and 6,200 gallons. The pumphouse measures 27 feet long, 25 feet wide, and 20 feet high.

The ICPP Tank Farm provides interim storage of acidic highly radioactive liquid waste before calcination. The tank farm consists of 18 tanks: two 320,000-gallon tanks, nine 300,000-gallon tanks, four 30,000-gallon tanks, and three 8,500-gallon tanks. Ten of the nominal 300,000-gallon tanks provide interim storage of highly radioactive liquid waste that is transferred to the tank farm from other facilities at ICPP. The eleventh 300,000-gallon tank is a spare. The three 18,500-gallon tanks are interim storage tanks for second- and third-cycle raffinates from the CPP-601 Building extraction operations. The four 30,000-gallon tanks are out-of-service because they do not meet Resource Conservation and Recovery Act (RCRA) secondary containment requirements.

Pad A at the RWMC was constructed in 1972 for disposal of solid mixed waste (i.e., hazardous waste contaminated with radioactive material) primarily from the Rocky Flats Plant in Colorado. Wastes were placed at Pad A from September 1972 until August 1978. There are 18,232 drums and 2,020 boxes containing contaminated sodium and nitrate salts, depleted uranium, beryllium, and low-activity waste. Pad A has not been used for any other function since 1978.

Pit 9 at the RWMC is an inactive waste disposal site that measures 379 feet long, 127 feet wide, and 17 feet deep. Pit 9 was open from November 1967 to June 1969 and contains 150,000 cubic feet of packaged waste; 350,000 cubic feet of interstitial soil; and 250,000 cubic feet of overburden. Remediation technologies are currently being evaluated to determine the most effective solution for retrieval, treatment, and final disposal of the wastes in Pit 9.

The ARVFS Sodium-Potassium Waste Storage Unit consists of a multiplate arch building that measures 9 feet, 3 inches high at the center; 16 feet wide; and 18 feet long. Soil has been placed over the top of the building to form a mound about 3 feet higher than the surrounding

terrain. The entrance to the bunker is sealed by a semicircular steel plate that is tack-welded in place. Stored in the bunker are four containers totaling 180 gallons of primary sodium-potassium coolant contaminated primarily with cesium, strontium, and other mixed fission products.

The PBF Reactor Area Evaporation Pond operated from 1972 to 1985 to support the Thermal Behavioral Program's testing of pressurized water reactor fuel rods under hypothetical accident conditions. Demineralized and secondary coolant was discharged to the pond between 1978 and 1984.

The ANL-W Analytical Laboratory performs chemical, radiochemical, and physical measurements in support of ANL-W nuclear activities. The Laboratory measures 11,000 square feet and houses six interconnected hot cells for remote analytical chemistry applications for irradiated and spent fuel, eight general-purpose laboratories for low-level and nonradioactive applications, one advanced analytical instrumentation laboratory for application to remote radioactive sample analysis, two laboratories for radiochemical counting, one glovebox laboratory, and two mass spectrometer laboratories.

In terms of facilities examined beyond those addressed in the INEL self-evaluation, the field verification team also reviewed the FAST Facility, the Waste Calcining Facility, and the Rover Headend Processing Plant at ICPP; the RSSF and the RSWF at ANL-W; and selected emergency response facilities. The FAST Facility was used for dissolution of spent naval nuclear fuel. This facility is 10,080 square feet and occupies five levels. The Waste Calcining Facility operated from 1963 to 1981, and was used to convert liquid radioactive waste to granular form. The New Waste Calcining Facility has served that function since 1982. The Rover Headend Processing Plant was used to recover enriched uranium from fuel used in the Rover project. The RSSF is used to store radioactive and mixed waste and consists of five weather-proof shipping containers holding radioactive sodium, sodium-potassium alloy, sodium-contaminated asbestos, and lead. The RSSF is located in the northeast corner of the ANL-W site. The RSWF is an interim storage area for radioactive scrap, radioactive waste, and mixed waste. The RSWF covers 4 acres north of the ANL-W site and consists of about 1,200 metal liners, 16–24 inches in diameter and about 13 feet long, buried vertically in the ground. Each of the liners is capped by a seal-welded cover.

2.0 SUMMARY OF RESULTS

The field verification process was designed to verify the accuracy and completeness of the data provided to the Chemical Safety Vulnerability Working Group by the INEL facilities selected to participate in the field self-evaluation process. The verification process offered an opportunity to examine site-specific chemical safety vulnerabilities and to make informed judgments about the seriousness of these conditions.

The goal of the field verification visit was to develop a prioritized list of chemical safety vulnerabilities at INEL. Before arriving on site, team members reviewed the self-evaluation data and other documents to allow team members to develop a list of observations related to potential vulnerabilities for their functional areas. During the onsite portion of the review, team members visited facilities selected for self-evaluation to verify reported observations and to look for other conditions or circumstances that might result in chemical safety vulnerabilities.

Facilities that were not included in the original self-evaluation were also reviewed (i.e., the FAST Facility, the Waste Calcining Facility, and the Rover Headend Processing Plant at the ICPP; the RSSF and the RSWF at ANL-W; and selected emergency response facilities).

To facilitate effective team management and to expedite the identification of vulnerabilities across a wide range of disciplines associated with chemical safety, the field verification review was organized to include five functional areas:

- Identification of chemical holdings, including the properties of chemicals located at the facility, the characterization of those chemicals, and an analysis of the inventory.

- Facility physical condition, including engineered barriers, maintenance conditions, chemical systems, safety systems, storage, monitoring systems, and hazards identification.

- Operational control and management systems, including organizational structure; requirements identification; hazard analysis; procedural adherence; maintenance control; engineering and design reviews; configuration control; safe shutdown plans; and site programs for quality assurance, chemical safety, inventory control, access control, disposal, transportation and packaging, and corrective actions.

- Human resource programs, including technical competence, staffing, training and qualifications, employee involvement, employee concerns, personnel performance requirements, and visitor and subcontractor control.

- Emergency management programs, including the emergency response plan, inplant consequences, environmental issues, coordination with the community, and community right-to-know issues.

These functional areas were evaluated on the basis of lines of inquiry provided in Attachment 1 of the "Field Verification Guide for the Chemical Safety Vulnerability Review," dated April 8, 1994. Verification of the self-evaluation data was accomplished by walkthrough of facilities, conduct of interviews with management and technical personnel, examination of facility and site documentation, and review of incident reports and other documents.

The INEL continues to face significant chemical hazards associated with its continuing operations, transition activities, and waste management and remediation activities. However, based on the facilities reviewed in this field verification, those hazards are generally well understood. Strong management systems and programs are in place to minimize or mitigate those hazards, and many commendable practices were documented. However, some weaknesses remain, and three vulnerabilities were identified.

Commendable practices identified related to chemical safety at the INEL include (1) the establishment of a sitewide chemical exchange system for excess chemicals; (2) successful efforts at the ICPP to eliminate inventory of bulk hazardous chemicals at facilities in transition; (3) the planning, execution, and documentation for the flushing of chemical storage and processing systems at the FAST Facility and the Fuel Processing Facility; (4) maintenance and work control related to chemical systems at the ICPP; (5) the replacement of aging safety

systems at the ANL-W Analytical Laboratory; (6) use of the Waste Management Authority (committee) at the ICPP to review waste implications prior to changes in process or chemical use/purchase; (7) a model chemical hygiene program for laboratory operations at the ANL-W Analytical Laboratory; (8) the use of the Idaho Training Advisory Council to facilitate the exchange of information and improve consistency of chemical-related training among site contractors; and (9) the development of a nomograph for use in planning response to chemical incidents at the ICPP. The results of the field verification review at INEL are summarized below.

2.1 Identification of Chemical Holdings

Verification activities for the chemical holdings functional area of the Chemical Safety Vulnerability Review for WINCO, EG&G Idaho, and ANL-W facilities at INEL included all applicable elements of the lines of inquiry. Special attention was given to the characterization, control, and documentation of chemical inventory and chemical wastes at INEL, and adequacy of storage and containment of those materials. All facilities included in the sites' self-evaluation were reviewed, as were the additional facilities described in Section 1.3.

A wide variety of hazardous materials are used at the INEL facilities reviewed, with WINCO being the largest user of process, cleanout, and analytical chemicals. The ANL-W chemical laboratory uses small quantities of more than 600 different chemicals; EG&G Idaho uses chemicals primarily in maintenance, analytical, and water treatment activities. Only very small quantities of highly hazardous materials, such as carcinogens, are used. Comprehensive inventories of all chemicals used are maintained for each facility. The WINCO electronic data base system (i.e., Haz-Trac) provides online tracking. The ANL-W electronic data base system (i.e., SARA Inventory) is updated quarterly for the site and monthly for the Laboratory. The EG&G Idaho electronic data base (i.e., SYSTEM 80) maintains its inventory by material name only and is used for procurement control, for meeting the Occupational Safety and Health Act (OSHA) Hazard Communication (HAZCOM) Standard, and for reporting required by Title III of the Superfund Amendments and Reauthorization Act. A physical inventory is taken annually to provide quantitative information. An effort to develop a unified chemical inventory tracking system for the entire INEL is being led by WINCO. An INEL sitewide electronic data base of available excess materials is maintained by EG&G Idaho, and is considered a commendable practice. When no onsite need materializes for excess chemicals, an effort is made to sell them back to suppliers or other users; failing this, the materials are designated as waste and disposed of properly.

Controls are exercised over procurement to ensure that quality, industrial hygiene, and waste minimization requirements are met. Workers are trained in the use of hazardous materials, are provided with material safety data sheets (MSDSs), and are informed about health hazards associated with hazardous materials in their workplace. Hazardous materials are appropriately labeled, and facilities in which these materials are used are posted as required by regulations. Storage of chemicals is governed by facility procedures, which require segregation according to compatibility classes. Storage cabinets, rooms, and areas observed by the verification team demonstrated good management practices. Bulk chemical storage areas in Building CPP-621 and chemical makeup areas in Buildings CPP-601, CPP-602, and CPP-666 are appropriately segregated and contained. Since the decision to discontinue spent fuel processing in 1992, excess chemicals from these facilities are being made available to

other users at INEL or are being sold to suppliers or other users; the resale of surplus chemicals is also considered a commendable practice.

Chemical heels and residues exist in some process equipment in WINCO facilities. The fluorinel dissolver equipment has been flushed and placed in standby; the condition of the facility is well documented. Cleanout of the chemical processing facilities in Buildings CPP-601 and CPP-602 is in progress. When the Waste Calcining Facility (Building CPP-633) was shut down in 1981, the process inventory was removed but the equipment was not cleaned and flushed. Thus, process residues remain in the calciner, and the silica gel columns used to trap ruthenium are still in place. The Rover Headend Processing Plant (Building CPP-640) was shut down in 1984. The aqueous process inventory was removed at the time and the aqueous processing equipment was flushed, but the inventory in the dry processing equipment was left in place. This inventory includes about 93 kilograms of enriched uranium. Plans for cleanout of these facilities are described in WINCO-1193, *Nuclear Fuel Reprocessing Phaseout for the Idaho Chemical Reprocessing Plant* (draft) (Rev.1), dated February 1994. The currently active high-level liquid waste tanks contain solids of unknown composition. A project is planned to retrieve and analyze sludge from one tank. All high-level waste tanks currently in service will be emptied and retired from service within 15–21 years.

The future disposition of some chemicals in process or in storage is uncertain. About 10,000 gallons of cooling water containing dichromate is stored in tanks, pipes, and coils in the tank farm. Current plans are to leave this material in place until the tank farm is retired in 15–21 years. About 1,000 gallons of hexone solvent extractant is being held in Building CPP-601 until the purity of the uranium products is confirmed to be acceptable and until there is no further use for the solvent extractant. When removed, it is likely that the hexone will be slightly contaminated with radionuclides and will thus be classified as mixed waste. Alternatives considered for disposal include burning in the Waste Experimental Reduction Facility (WERF) incinerator or in a licensed commercial incinerator. Other chemicals in a similar status include radioactively contaminated sodium and sodium-potassium being stored by ANL-W and EG&G Idaho. An alternative being considered is to deactivate these highly reactive materials in ANL-W facilities. Further evaluation of these alternatives is in progress.

About 400 spills, leaks, and discharges of hazardous materials to the soil have been identified for INEL, with 83 of these being at ICPP. The WINCO Environmental Restoration Program is intended to identify, characterize, and remediate (if required) such occurrences consistent with applicable regulatory requirements. Administrative and engineered controls are in place to minimize risks to workers.

Large quantities of hazardous and radioactive wastes have been placed in the RWMC, including Pit 9 and Pad A. These areas will be controlled and/or remediated under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and RCRA.

Strong RCRA waste management programs have been developed, and practices that conform to requirements have been implemented. Wastes are characterized before disposition, usually through sampling and analysis, although historical values are used in repetitive situations.

Qualified personnel review planned generation of wastes for control, minimization, and compliance with applicable laws, rules, and regulations governing the generation, handling, storage, treatment, and final disposition of waste streams. WINCO established the Waste Management Authority to ensure that these goals are accomplished. The field verification team regards this effort as a commendable practice. All RCRA hazardous and mixed waste drum storage areas reviewed demonstrated compliance with regulations and site requirements.

Both air and water discharges are controlled. Comprehensive surveys of air emission points have been or will be completed, primarily in response to forthcoming permit requirements specified by Title V of the Clean Air Act Amendments. Analyses have been conducted for criteria pollutants and substances on the toxics list. Similar surveys of process and sanitary water have been or will be completed (1) to ensure proper routing of process and sanitary wastes, (2) to reduce point source discharges, and (3) to evaluate opportunities for source reduction. Aqueous discharges are permitted under the National Pollutant Discharge Elimination System and the State of Idaho Wastewater Land Application Permitting System. At ANL-W, all wastewater from sinks in laboratories and janitors' closets is collected and characterized to determine the appropriate disposition. This practice is considered a commendable practice.

Two vulnerabilities were identified related to chemical holdings. First, numerous spills, leaks, and discharges of hazardous materials to soil have occurred at INEL. Known release sites have been cataloged and investigated and are being remediated, as appropriate. Additional release sites may be discovered when soil is disturbed and, if not properly controlled, could pose hazards to workers. Second, hazardous materials have been stored for extended periods at the INEL without provision for their final disposition. These materials include sodium and sodium-potassium, cooling water containing dichromate, and hexone. A more detailed discussion of these vulnerabilities is provided in Section 3.2 and in Attachment 2 of this appendix.

2.2 Facility Physical Condition

Verification activities for the facility physical condition functional area of the Chemical Safety Vulnerability Review included review of the overall condition of facilities and the effectiveness of maintenance activities as they relate to chemical safety. Facilities, maintenance programs, and work activities of three site contractors—ANL-W, EG&G Idaho, and WINCO—were examined. Areas evaluated included (1) engineering design control and configuration management; (2) work control and conduct of maintenance activities, including pre-work safety evaluation; (3) corrective and preventive maintenance (PM) programs; (4) implementation of administrative controls to protect workers, including the use of lockout/tagout, special work permits, and the use of personal protective equipment (PPE); (5) the condition of chemical primary and secondary containments; (6) identification of chemical hazards, including proper labeling of chemical containments and piping; and (7) the proper control and use of hazardous chemicals, such as solvents and paints, during maintenance of facilities and equipment. In addition to the typical evaluation methods used, regularly scheduled maintenance and planning meetings were attended.

Evaluation of engineering control programs focused on procedures, quality assurance, and configuration management. ANL-W requires only a limited amount of nonreactor design support and, therefore, prefers to rely on Plant Services or offsite contractors for this work. ANL-W procedures for nonreactor engineering control and acceptance exist. However, in one instance observed, these procedures failed to prevent a subcontractor working on the hot cell modification project from supplying equipment that was not suited for the intended application. The deficiency was discovered by facility management as the equipment was being readied for installation. In this case, project quality ultimately depended on the owner and not necessarily on how well the quality assurance program for engineering functioned. ANL-W is currently reworking all aging critical and safety-related systems in Building 752 (e.g., electrical, ventilation, steam, waste lines, chemical drains) and is maintaining up-to-date as-built drawings and equipment files for this work.

EG&G Idaho and WINCO have well-developed engineering procedures and standards that are based on adherence to relevant national consensus documents and require appropriate levels of verification and approval commensurate with the risk and consequence of equipment or system failure. The design of chemical systems and the selection and acceptance of related equipment are adequately addressed in these programs. Thus, all design engineering work, whether performed by onsite staff or by offsite contractors, is being adequately controlled and integrated into the maintenance work control system. All new maintenance tasks performed at EG&G Idaho and WINCO facilities are being documented individually, and projects are systematically completed and closed. To date, all facility safety system documentation has been updated. Both contractors are actively pursuing reduction of their backlogs for nonsafety-system as-built drawings, and adequate progress is being reported.

The evaluation of maintenance programs focused on work control and preventive maintenance activities, emphasizing the integration of engineering support into work packages, the reduction of risk to maintenance workers through work control and pre-job safety analysis, the avoidance of catastrophic equipment failure through effective prevention programs, and the safe control and use of hazardous chemicals in maintenance activities.

The three site contractors' maintenance work control programs are functioning effectively. At a minimum, each work control program requires that a pre-work safety evaluation be performed and that the necessary safety controls (e.g., PPE, lockout/tagout, process or pressure isolation) and administrative controls (e.g., quality levels, special work permits, and radiation work permits) are identified. Under these programs, work orders are reviewed and approved by representatives from the quality assurance, environment, safety, and health physics organizations before work is initiated, and work orders are closed only after the necessary postmaintenance testing has been completed and verified. The Total Quality Management (TQM) Core Team's approach to work control was developed by WINCO and has been identified by the field verification team as a commendable practice. It was noted that WINCO also requires that drawings and equipment files be updated (i.e., as-built) before approving closure of maintenance work orders.

Each site contractor has implemented a preventive maintenance program. Neither ANL-W nor EG&G Idaho reports a backlog of preventive maintenance, but both allow a 25-percent grace period before a task is reported as overdue (e.g., annual preventive maintenance is afforded a 3-month grace period). WINCO reports no backlog of preventive maintenance tasks and

allows no grace period. WINCO Plant Services reports a preventive maintenance delinquency rate average for the last 12 months of less than 0.5 percent. Both EG&G Idaho and WINCO have also adopted predictive maintenance techniques to warn about pending equipment failure. Such techniques include vibration analysis, thermography, and analysis of used lubricating oil.

All three contractors demonstrated a proactive attitude toward identifying and mitigating chemical hazards in their facilities. Chemical piping, tankage, pressure vessels, and primary and secondary chemical containers were found to be appropriately labeled and in generally good mechanical condition. One aluminum nitrate tank in Building CPP-621 was removed from service when cracks were observed in its shell. Subsequent evaluation determined that this tank was not fit for further service, and it was flushed and retired. Secondary containments, including berms, dikes, and engineered containments, were found to be in good condition. The removal of all underground fuel tanks at the INEL is scheduled for completion within the next 2 years.

In addition to reducing process chemical inventories, each contractor has effectively minimized inventories of maintenance solvents and has replaced hazardous solvents with nonhazardous substitutes. MSDSs are available near chemical storage and use areas, and maintenance workers are qualified in their use and interpretation.

The physical condition of the facilities and waste sites was found to be as reported in the contractors' self-evaluations. ANL-W is currently refurbishing and modifying the 30-year-old hot cells and ventilation systems in Building 752. Because of this ongoing project, housekeeping in active work areas was not impressive, but it was evident that contamination was being well controlled. Significant progress in sampling, characterizing, emptying, and flushing unused, obsolete chemical systems has been made in Building 752. However, except for the removal of a contaminated perchloric acid fume hood without incident, there has been insufficient funding available to complete the removal of these systems and to make better use of the building space.

The EG&G Idaho waste storage and disposal sites selected for evaluation have no associated physical facilities other than inflatable buildings, burial pads, and underground bunkers. A limited review of these sites revealed no physical deficiencies. Air-monitoring instruments were reported to be operating properly, and the access control fencing and other personnel entry barriers appeared to be in good condition.

The WINCO facilities evaluated included the ICPP Fuel Processing Buildings CPP-601/602, the modern FAST Facility, and the Chemical Storage Area (Building CPP-621). Each of these facilities was found to be in good condition and demonstrated exemplary housekeeping. During previous fuel-processing campaigns in the older buildings, noncorrosion-resistant transfer piping developed an undetected leak, releasing hazardous chemicals to the soil column. In this case, the leak was directly beneath the facility and has yet to be characterized or remediated. When this leak was discovered, accurate flow-metering instrumentation and new encased transfer piping were installed in several ICPP applications to detect and contain future leakage. Because of the decision to discontinue the processing of spent fuel at the INEL, chemicals are being removed from each of the WINCO facilities noted above. Most process piping and vessels are being emptied and flushed. Noncontaminated bulk chemicals

are either being sold to offsite commercial chemical operations or are being used in other operations at INEL.

No chemical vulnerabilities related to the facility physical condition functional area were identified for the three site contractors reviewed.

2.3 Operational Control and Management Systems

Verification activities for the operational control and management systems functional area of the Chemical Safety Vulnerability Review included examination of selected systems used by INEL site contractor management to improve chemical safety and to limit vulnerability in chemical and waste-handling operations. The management systems of the three management and operating (M&O) contractors—WINCO, EG&G Idaho, and ANL-W—were reviewed, and this review was augmented by interviewing the ID facility managers assigned to oversee the ICPP and the RWMC and by interviewing the President of the local chapter of the Oil, Chemical, and Atomic Workers (OCAW) Union, which represents organized employees of these three contractors.

Management at WINCO and EG&G Idaho has established systems that are judged to provide an acceptable degree of chemical safety in the conduct of activities, programs, and operations. The review of management systems in ANL-W facilities did not indicate any chemical safety vulnerabilities; however, as stated in Section 1.1, this review did not address management systems operative in the part of ANL-W that experienced a chlorine gas release on April 15, 1994. A Type A Accident Investigation Team is investigating those issues concurrent with this review.

All three M&O contractors have implemented management systems designed to ensure adequate safety review prior to procurement of hazardous chemicals. Although the systems differ in operational detail, they all rely on industrial hygiene specialists to judge (1) whether the requester is properly trained to handle the chemical safely, (2) whether the requester's facility is adequately equipped for use of the chemical, and (3) whether a less hazardous chemical might fulfill the objectives of the experiment. In addition, WINCO established the Waste Management Authority, which is charged with ensuring that all mixed, hazardous, radioactive, and liquid industrial waste streams are identified, minimized, and controlled to meet best waste management practices and to conform to applicable regulations and agreements.

Systems of management review and authorization of operations involving the use of chemicals are in place for all three contractors:

- WINCO has a well-developed safety analysis system that requires hazard and accident analyses for new or modified operations that exceed prior experience at the ICPP. WINCO has also implemented a formal system of scrutinizing all proposals for new or modified operations for unreviewed safety questions and for performing unreviewed safety question determinations where indicated. Moreover, WINCO is in the process of upgrading its current safety analyses to conform to the requirements of the recently issued DOE 5480.23.

- EG&G Idaho management requires a preliminary hazards screening to determine whether a proposed or modified operation transcends safety considerations previously experienced and analyzed and, if so, requires that a formal safety analysis be prepared, reviewed, and approved before initiating the operation. Environmental checklists document the elements and actions that must be completed in fulfilling the requirements of a hazards analysis. EG&G Idaho has issued a preliminary hazards analysis for the remediation project at RWMC Pit 9. This project is designed to remove from the Pit 9 burial site the actinide and mixed waste containers with actinide contents that exceed 10 nanocuries per gram. The hazards analysis for the project is being prepared in phases. Phase 1 (i.e., the preliminary hazards analysis) was completed in 1992; Phase 2 will be completed by a selected contractor in late 1994; and the Final Safety Analysis Report is expected to be completed in 1996, before the initiation of full-scale remediation.

- ANL-W management mandates the preparation of hazards assessments for new or modified operations that do not fall within previously analyzed Laboratory experience. The *ANL-W Environment, Safety and Health Manual*, Section II–Chapter 15, dated February 1, 1986, defines the protocol for preparing hazards assessments.

Each of the three M&O contractors has a well-developed and functioning system for reporting and investigating abnormal events, including provisions to address "near misses" and to emphasize "lessons learned." The ANL-W system is described in the *ANL-W Procedures Manual* and includes a well-structured critique procedure. Formal safety committee meetings are used to publicize "lessons learned."

Based on the observations noted in the facilities visited during the review, all three M&O contractors have implemented comprehensive industrial hygiene programs to address facility-specific health hazards. All have work control systems, incorporating such elements as work permits, hazard analyses, health and safety plans, and procedure reviews. These systems were designed to ensure that health hazards are identified and that proper protective measures, such as PPE and engineering controls, are used to mitigate hazard consequences and to protect worker health. In addition, INEL instituted the Industrial Hygiene Steering Committee to facilitate consistency within the different contractor industrial hygiene programs.

The type of maintenance work control program selected and the style of program management adopted by each of the three M&O contractors depend on the magnitude of the contract, on the complexity of the present and past operations to be maintained, and on the distribution of the work force at INEL. ANL-W has been involved in liquid metal reactor research and development with all operations located at one site. WINCO was primarily a chemical processor but is now a manager of fuel and waste, with all operations also at a single site. EG&G Idaho is a reactor operator, waste manager, and site support contractor, with its operations work force split among 10 individual sites.

In those facilities examined in this review, ANL-W depends less on formal, complex, computer-based work control programs and more on the professionalism and diligence of its facility management staff in planning and scheduling maintenance, procuring and accepting materials, preparing and approving work package documents, providing specific technical direction, establishing and maintaining the appropriate levels of quality, and overseeing the safety of maintenance work. Because ANL-W maintenance operations are of a relatively

smaller scale and may be less schedule driven than those of other INEL contractors, this approach is entirely appropriate.

WINCO has adopted the principles of TQM in its maintenance program. Maintenance work control has been decentralized by establishing core teams of qualified employees, with each team member being equally empowered to strategize, evaluate, approve, and implement work orders within the bounds of individual responsibility and expertise. Each team includes (1) permanently assigned specialists in integrated scheduling and facility engineering; (2) multicraft maintenance foremen; and (3) specialists in planning, administration, environment, safety, health physics or industrial hygiene, quality, and materials procurement. Senior management is apprised of work progress by the daily reporting of exceptions, allowing them to focus more clearly on problem areas. This work control system has been functioning successfully for 1 year.

EG&G Idaho, with its diverse mission and widely distributed work force, has elected to institutionalize the control of maintenance work by publishing an administrative policy that defines the minimum programmatic requirements for maintenance and allows each of the 10 operating areas to develop and implement its own program. However, through a series of self-assessments, EG&G Idaho has determined that a significant diversity exists among the 10 areas with respect to their interpretation and degree of implementation of the policy. To address this problem, a revision to the policy is planned and the *EG&G Idaho Conduct of Maintenance Manual* was issued on July 1, 1993. A revised work control process has been developed and is scheduled for full implementation by late October 1994.

Also, EG&G Idaho is piloting an innovative, computer-based maintenance work control program based on a comprehensive master equipment list. This program links specific pieces of equipment and systems to service hazards, quality assurance levels, and safety and health requirements. As currently envisioned, the equipment number and specific maintenance task will be entered, and the computer, in turn, will be used to define the necessary administrative requirements and controls for performing the task safely and then to print the work order. The schedule for full implementation of this program has not yet been developed.

The DOE decision in 1992 to cease spent reactor fuel reprocessing at the ICPP has required the WINCO organization to develop a shutdown plan for most of its chemical operations. In response to this need, WINCO issued WINCO-1193, *Nuclear Fuel Reprocessing Phaseout Plan for the Idaho Chemical Processing Plant* (draft) (Rev. 1), dated February 1994, and WINCO-1174, *Idaho Chemical Processing Plant Transition Plan*, dated March 1994. These documents clearly articulate the steps required to complete the chemical process mission and to secure selected facilities either for total closure or for future operations with a different mission.

Recent steps have been taken to improve the effectiveness of the ID oversight system at INEL. ID facility managers are now located at the site and are provided (through a modified matrix management system) with technical managers and "facility representatives" to maintain near-continuous oversight of field operations. The new system is designed to reduce paperwork and to rely on direct personal communications to enhance the benefits of DOE oversight. One of these benefits is improved chemical safety. Thus far, the revised oversight system is judged by ID management to have worked well in achieving its objectives. The

facility managers have been given considerable latitude in allocating their resources to meet oversight needs for their specific facilities.

The effectiveness of the union-management relationship at INEL was examined during discussions with the President of the local chapter of the OCAW, which represents 1,169 employees of WINCO, EG&G Idaho, and ANL-W at INEL. Union membership has raised no issues in recent years related to chemical safety problems at INEL. The current safety program atmosphere is judged to be conducive to promoting cooperation and collaboration between the local union and M&O contractors in maintaining safety performance (including chemical safety performance) at a high level. The effectiveness of the joint union/management councils in addressing safety issues appears to be a major factor in contributing to high safety morale at INEL.

No chemical safety vulnerabilities related to the operational control and management systems functional area were identified for the three site contractors reviewed.

2.4 Human Resource Programs

Verification activities for the human resources programs functional area of the Chemical Safety Vulnerability Review at the INEL included all elements of the lines of inquiry, with particular emphasis on issues related to training, staffing, employee involvement, and visitor and subcontractor control. The programs of four site contractors, EG&G Idaho, WINCO, ANL-W, and MK-FIC (the site construction manager), as they are implemented in the facilities for which self-evaluations were performed, were examined during the site visit. The review addressed staffing, training content, management commitment, and employee involvement, including "stop-work" authority.

Staffing levels at all four contractor organizations were judged to be appropriate to ensure that chemical safety and training issues in the facilities were adequately addressed. Based on the findings of INEL Environment, Safety, and Health Progress Assessment, there is an open position for an industrial hygienist at AAO-W and an open action item to create such a position at ID. Filling these positions will enhance oversight of the contractor's chemical safety related programs.

Each of the site contractors at INEL provides training organizations. Mandatory 24- or 40-hour hazardous waste operations training, as well as DOE Radiological Control (RADCON) Manual Radiological Worker Training, is provided either by the site contractor or by Eastern Idaho Technical College through a contract arrangement, depending on demand. The training provided meets OSHA requirements stipulated in 29 CFR 1910.120, "Hazardous Waste Operations and Emergency Response," as well as the *DOE RADCON Manual.*

Training provided to site personnel on the requirements of 29 CFR 1910.1200, "Hazard Communication," and 29 CFR 1910.1450, "Occupational Exposure to Hazardous Chemicals in Laboratories," was also examined. All INEL and subcontractor personnel receive basic hazard communication and facility-specific training as part of General Employee Training. The purpose of this training is to acquaint all personnel with the pertinent statutory requirements for hazard communications, as well as to familiarize them with warning labels, signs, "stop-work" authority, and MSDSs. Other specialized training (e.g., for carcinogen control, toxic

Substance Control Act overview, nitric acid safety) is provided as job requirements dictate. All the training modules examined were performance based, with a minimum passing score of 80 percent required. Retraining is facilitated through the use of computerized tracking systems. In all cases observed, training required by site personnel was current and appropriate for access to the facility in question. Proof of training was required before facility access was allowed. Each of the site contractors performs audits and self-assessments of their training programs, including reviews of subcontractor training records.

Two of the site training programs or initiatives reviewed deserve particular mention. The ANL-W Analytical Laboratory has a model chemical hygiene training program that exceeds the requirements of the OSHA Laboratory Standard, the OSHA HAZCOM Standard, and DOE 5480.10. The assigned Chemical Hygiene Officer has implemented this standard proactively. The storage, labeling, and administrative controls for the purchase, handling, and disposition of chemicals are excellent. The Chemical Hygiene Officer has made a concerted effort to find substitutes for high-risk chemicals such as ethers and benzene. The training program provided to the Analytical Laboratory staff is current, succinct, and performance based. The observed condition of the chemical laboratories in this aging facility indicates the excellence of the chemical safety training provided, and serves as a model program for other organizational elements to follow. The second training initiative of note was the establishment of the Idaho Training Advisory Council. The purpose of this council, which has representatives from all the site contractors and ID, is to act as a forum for discussing INEL training issues and making recommendations to management. The council is also working on standardizing safety training throughout the INEL, as well as coordinating training efforts and sharing resources. The council's structure and its products will be particularly useful during the upcoming transition to a new site contractor team.

The INEL site contractors are promoting a high level of worker awareness on all safety issues, including the handling and use of chemicals. In addition to formal training, HAZCOM materials (including MSDSs) were prominently displayed in all facilities visited. Promotional materials emphasizing chemical safety, as well as the fact that all employees have the right and responsibility to stop unsafe work practices, were also much in evidence. These issues are discussed periodically in safety committee meetings. Lessons learned from the site and other DOE facilities are also reviewed. There is a strong commitment on the part of all site contractors about the importance of safety training and worker involvement in making the workplace safer. This translates to a maturing safety culture at the INEL site. INEL has the necessary human resource systems in place to meet both DOE and OSHA requirements in the area of chemical safety. Personnel observed were well trained, motivated, and cognizant of the chemical hazards in their facilities.

No explicit chemical vulnerability issues related to the human resource programs were identified for the four site contractors reviewed.

2.5 Emergency Management Programs

Verification activities for emergency management programs functional area of the Chemical Safety Vulnerability Review included evaluation of the effectiveness of emergency management activities, plans, and programs in the context of chemical safety vulnerabilities associated with INEL facilities. All facilities examined in the sites' self-evaluations were

reviewed; in some emergency management areas, the review was necessarily expanded to include INEL sitewide emergency operations.

The INEL Emergency Management System comprises several comprehensive emergency management program elements, including emergency plans and procedures, coordination between the INEL and the community, emergency response training and drills or exercises, emergency supplies and equipment, and supporting emergency facilities. The top-level document that establishes and describes the INEL's overall emergency management program is the *Idaho National Engineering Laboratory/West Valley Demonstration Project Emergency Plan 1993*. Subordinate to this document are a series of facility-specific emergency plans, building-specific emergency plans, and associated emergency plan implementing procedures that have been developed at the INEL. All facility-specific emergency plans reviewed addressed emergency response to nonradioactive hazardous chemical accidents. The quality of the planning documents reviewed varied among the site contractors, but a series of improvements are being implemented. The INEL has appointed an offsite emergency planning coordinator to represent ID and all INEL contractors and to coordinate all offsite emergency planning activities for offsite agencies. This person is also a member of the Local Emergency Planning Committee. This appointment has improved the offsite participation and coordination associated with INEL emergency management programs.

The INEL maintains several types of emergency response facilities to support INEL emergency management programs. The INEL Emergency Operations Center (EOC), the INEL Warning Communications Center (WCC), the ICPP Emergency Control Center (ECC), and the ANL-W ECC were reviewed. No concerns were identified in these facilities. The INEL EOC and the INEL WCC are relatively new and are very impressive facilities. Weather updates are automatically provided to the INEL EOC every 6 minutes by the National Oceanic and Atmospheric Administration. The INEL EOC also maintains the capability to conduct hazardous chemical plume dispersion calculations by various approved computer models.

In the event of a hazardous chemical emergency at an INEL facility, a sitewide "777" emergency telephone number is available (except at ANL-W) for rapid reporting of the occurrence to the INEL WCC. The INEL WCC will initiate off-facility emergency response actions. The first responder on the scene at the originating facility will be in charge at the scene until properly relieved. First responders are concerned only with protecting people and assessing emergency conditions. The incident command system methodology has recently been implemented at the INEL. Incident command will be established on scene by the incident response team leader. If available, the facility incident response team will provide the initial hazardous material (HAZMAT) response. The INEL Fire Department will also respond to provide additional HAZMAT or other support and/or mitigation. If necessary, an emergency command center and the INEL EOC will be activated to provide additional support in the event of an emergency involving hazardous chemicals. During discussions with WINCO ICPP emergency preparedness and hazard analysis personnel, it was learned that a nomograph is being developed that will provide for a rapid determination of the impacted distance of a hazardous chemical release and is expected to improve the emergency response on backshifts without reliance on a sophisticated computer model. The development of this tool is considered to be a commendable practice.

Members of the ANL-W facility Incident Response Team (IRT) and INEL Fire Department firefighters (3 firestations on site with a total onshift complement of about 16 responders) are trained by the State of Idaho in HAZMAT response to the HAZMAT "technician" level. The ICPP IRT is trained to the same levels by the ICPP Training section; EG&G Idaho personnel train members of their IRT.

The number of drills and exercises emphasizing hazardous chemical accident scenarios both within INEL facilities and off site is increasing. A closer working relationship is being established among site contractors, the INEL Fire Department, and the fire departments of surrounding communities. The extent of coordination and cooperation is exemplified by joint participation in training and drills and periodic meetings with community officials. The INEL dedicated HAZMAT vehicle provides backup support for offsite emergencies.

The INEL facilities reviewed that contain significant quantities of hazardous chemicals maintain adequate types and quantities of HAZMAT response equipment and supplies, including Level A suits. The INEL Fire Department maintains a dedicated HAZMAT response vehicle and additional supplies. A new sophisticated HAZMAT truck is on order and is expected to arrive soon. The CFA ECC provides logistical support for all types of emergency responses. If additional fire, hazardous materials, and/or emergency medical response resources are needed, firefighters and vehicles from surrounding communities can be provided through implementation of memorandums of understanding. Backup HAZMAT support personnel, dedicated vehicles, and supplies are available from Idaho Falls, Blackfoot, and Pocatello, Idaho.

One vulnerability was identified in the functional area of emergency management programs. The vulnerability arises from the fact that some emergency management program documentation is missing, inadequate, in error, or out-of-date. Implementation of the *Idaho National Engineering Laboratory/West Valley Demonstration Project Emergency Plan 1993* in the event of a sitewide hazardous materials emergency is not certain because the formal procedures to implement the *Idaho National Engineering Laboratory/West Valley Demonstration Project Plan 1993* and the emergency action levels (EALs) have yet to be developed. These sitewide procedures (i.e., emergency plan implementing procedures [EPIPs]) are to identify the detailed actions necessary to achieve an integrated, sitewide emergency response as set forth in DOE 5500.3A. Supporting emergency plan information and procedures for implementing the incident command system at ANL-W are missing but are under development and are nearing completion; some plan information is outdated. EALs are not consistent across the site and in some cases are missing, inadequate, in error, or incomplete. The absence or inconsistency of this documentation represents an INEL sitewide emergency management program vulnerability. A more detailed discussion of this vulnerability is provided in Section 3.2 and in Attachment 2 of this appendix.

3.0 CATEGORIZATION AND PRIORITIZATION OF VULNERABILITIES

3.1 Criteria

A vulnerability is a weakness or potential weakness involving hazardous chemicals that could result in a threat to the environment, the public, or worker health and safety. Vulnerabilities can be characterized by physical or programmatic conditions associated with uncertainties, acknowledged weaknesses, and/or unacknowledged weaknesses in the area of chemical safety. Conditions required to create the vulnerability should either currently exist or be reasonably expected to exist in the future, based on degradation of systems and chemicals or through expected actions (e.g., D&D of facilities).

A vulnerability will be determined to exist if current or expected future conditions or weaknesses could result in the following:

- The death of or serious physical harm[2] to a worker or a member of the public, or the continuous exposure of a worker or member of the public to levels of hazardous chemicals above hazardous limits; or

- Environmental impacts resulting from the release of hazardous chemicals above established limits.

The prioritization of the chemical safety vulnerabilities is based on the professional judgment of team members concerning the immediacy of the potential consequences posed by each vulnerability and on the potential severity of those consequences. The first step in the prioritization process was to group vulnerabilities according to the timeframe in which they are expected to produce consequences. The following categories are defined for the timeframe within which the consequences are expected to occur:

- Immediate—Any chemical safety vulnerability that could result in immediate consequences.

- Short-Term—Any chemical safety vulnerability at a facility in which there is a significant chance of a consequence occurring within a 3-year timeframe, as a result of chemical degradation, change in mission for the facility, degradation of the containment systems, change in personnel at the facility, or other factors affecting the facility.

- Medium-Term—Any chemical safety vulnerability at a facility in which there is a significant chance of a consequence occurring within a 3–10-year timeframe, as a result of chemical degradation, change in mission for the facility, degradation of the containment systems, change in personnel at the facility, or other factors affecting the facility.

- Long-Term—Any chemical safety vulnerability at a facility in which there is a significant chance of a consequence occurring in the timeframe greater than 10 years as a result of

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[2] Serious physical harm is defined as impairment of the body, leaving part of the body functionally useless or substantially reducing efficiency on or off the job.

chemical degradation, change in mission for the facility, degradation of the containment systems, change in personnel at the facility, or other factors affecting the facility.

Vulnerabilities within each category are further prioritized, based on the severity of the potential consequences, as "high," "medium," or "low" priority. Consequences of high priority would cause death or irreversible injury or illness to workers or the public, or would cause environmental damage that is irreversible or very costly to remediate. Low-priority consequences would be reversible injuries, illness, or environmental damage.

3.2 Chemical Safety Vulnerabilities at Idaho National Engineering Laboratory

Three vulnerabilities were identified by the verification review at the INEL. Each is summarized below and presented in more detail in Attachment 2 of this appendix.

CSVR-INEL-CH-01: Contamination of Soil by Discharges of Large Quantities of Hazardous Material.

Four hundred spills, leaks, and discharges of hazardous materials to the soil have been identified for INEL, 83 of which were found at ICPP. Spills of hazardous materials have occurred from process lines and from bulk storage areas at the ICPP. In the past, there have also been intentional discharges of hazardous materials to soils. Known releases have occurred from pipes in the vent tunnel at CPP-601, from bulk chemical storage facilities at CPP-621, and leaks of high-level waste and dichromate at the tank farm. Other releases to soil have occurred through discharge of cleaning agents to french drains, tank overflows, punctured drums, and discarded paints and paint solvents.

These leaks, spills, and discharges create the potential for the future exposure of workers and release to the environment during construction, D&D, and other activities that disturb the soil. WINCO has taken several important steps to mitigate those hazards. Efforts have been made to identify, investigate, and in some cases remediate historical leak sites, and procedures are in place specifying required actions in the event that additional spill locations are discovered. Known locations have been designated as Environmentally Controlled Areas and are posted to protect the health and safety of workers. These conditions and circumstances represent a low-priority vulnerability with a potential for short-term consequences.

CSVR-INEL-CH-02: Delays in Disposition of Hazardous Materials and Waste.

For some facilities, the INEL has made substantial progress in arranging for final disposition of surplus hazardous chemicals and improperly stored hazardous wastes. However, there are several examples where planning and arrangement for final disposition have not been provided. About 10,000 gallons of cooling water containing dichromate are stored in two tanks without secondary containment in the ICPP tank farm area. The cooling system has not been used since 1988 and will not be needed again for at least 5–10 years.

In addition, about 1,000 gallons of reclaimed hexone solvent extractant is being held in cell tankage in CPP-601. The material is contaminated with fission products, and its future use and disposition are uncertain. The ARVFS bunker managed by EG&G Idaho contains four containers of sodium-potassium mixed waste that have been stored there since 1974. The

bunker is an interim-status storage facility, and the containers were last inspected in 1979. The condition of the containers is unknown. Treatment options are currently being considered for both of the latter examples; however, each represents a continuing risk to workers and the environment that could be eliminated by their removal for treatment or disposal. These conditions and circumstances represent a medium-priority vulnerability with a potential for medium-term consequences.

CSVR-INEL-EMP-01: Weaknesses in the INEL Emergency Management Programs Documentation.

The *Idaho National Engineering Laboratory/West Valley Demonstration Project Emergency Plan 1993* was developed to ensure consistent and controlled emergency response actions for any operational emergency, including those associated with chemical incidents. However, the plan is not supported by EPIPs and does not include EALs. In addition, EALs for hazardous chemical events are inconsistent among INEL contractors and within the INEL Emergency Plan. Some hazardous material EALs are inconsistent between a contractor's plan and their own EPIPs.

The EPIPs and the EALs play a fundamental role in ensuring proper response to a chemical emergency. EALs are the specific indicators used to determine occurrence category and emergency class. The category of emergency (based on severity) drives the level of activation, the level of initial resources, and protective measures taken on or off site. If the level of initial response is incorrect, an incident could escalate. These conditions and circumstances represent a medium-priority vulnerability with a potential for immediate consequences.

ATTACHMENT 1

TEAM COMPOSITION

Area of Responsibility	Name/Organization
Team Leader	Michael A. Kilpatrick Office of Environment, Safety and Health U.S. Department of Energy
Management/Operations	Leon H. Meyer The LHM Corporation
Human Resource Programs	John A. Leonowich Battelle, Pacific Northwest Laboratory
Chemical Process Safety	John A. Porter JP Techservices, Inc.
Industrial Hygiene	Kim L. Delman Albuquerque Operations Office U.S. Department of Energy
Environmental Protection	Raymond F. Machacek Arthur D. Little, Inc.
Maintenance	John S. Stone ICF Kaiser Hanford
Emergency Management	Robert D. Mogle Battelle, Pacific Northwest Laboratory
Site Liaison	Don S. Michaelson Idaho Operations Office U.S. Department of Energy
Coordinator	Rita A. Bieri Los Alamos National Laboratory
Technical Editor	Robert F. McCallum McCallum-Turner, Inc.

ATTACHMENT 2

CHEMICAL SAFETY VULNERABILITY REVIEW
VULNERABILITY FORM

DATE: May 10, 1994

Site/Facility:	Idaho National Engineering Laboratory
Vulnerability Number:	CSVR-INEL-CH-01
Functional Area(s):	Identification of Chemical Holdings

1. Brief Description of Vulnerability.

   Contamination of soil by discharge of large quantities of hazardous materials.

2. Summary of Vulnerability.

   Four hundred spills, leaks, and discharges of hazardous materials have been identified for the INEL, 83 of which were found at the Idaho Chemical Processing Plant (ICPP). Spills of hazardous materials to soil have occurred from process lines and from bulk storage areas at ICPP. In the past, there have also been intentional discharges of hazardous materials. Known occurrences have been characterized and remediated, where appropriate. In the absence of good records of the early history of the INEL, additional spill/discharge areas may be discovered in the future and could pose a hazard to workers.

3. Basis.

   a. Requirements:
      - DOE 5400.1 requires that the environment be protected.
      - DOE 5480.10 requires that the health of workers be protected.
      - IDAPA 16.01.05 specifies Idaho Rules, Regulations, and Standards for identification of and treatment, storage, and disposal of hazardous waste.
      - 40 CFR 300, "Comprehensive Environmental Response, Compensation, and Liability Act," specifies regulations for investigation and cleanup of waste sites.

   b. Chemicals Involved: Various process solutions and bulk chemicals, including acids, bases, inorganics, and organics.

   c. Relevant Self-Evaluation Data: The self-evaluations acknowledged that spills and discharges of hazardous materials have occurred.

   d. Contributing Causes: Lack of definitive requirements and informal conduct of operations in the early history of the INEL.

   e. Potential Consequences: Potential for exposure of employees to hazardous materials in future activities that disturb the soil (e.g., construction, decontamination and decommissioning). These conditions and circumstances represent a low-priority vulnerability with a potential for short-term consequences.

Site/Facility:	Idaho National Engineering Laboratory
Vulnerability Number:	CSVR-INEL-CH-01
Functional Area(s):	Identification of Chemical Holdings

4. Supporting Observations.

- Building CPP-601 - A leak of condensate from the vent tunnel occurred when a pipe corroded. Other uncontained lines have been removed from service and replaced with contained ones. Examination of the old lines showed no evidence of other leaks, but the lines could not be examined in their entirety. Thus, other leaks under this or other structures are possible.
- Building CPP-621 - Leaks and spills of chemicals (i.e., nitric acid, sulfuric acid, hydrofluoric acid, and aluminum nitrate) occurred in the bulk chemical storage area, mainly in the early history of the INEL (i.e., 1950s–1980s) but are not well documented. French drains were at one time used for disposal of acid leaks and spills. Leaks have occurred in the earthen pipe trench leading from the storage area to the chemical processing building. This trench was previously uncontained but now has a plastic liner at the bottom.
- Tank Farm - There were two known leaks of high-level liquid waste (containing hazardous chemicals as well as radionuclides) to soil and at least one known leak of cooling water containing dichromate. Pipes used in the transfer of wastes to the tank farm have also leaked.
- Chlorinated hydrocarbon cleaning agents used in maintenance activities were disposed of by discharge to french drains. Grease pits were used for the discharge of oils and greases.
- Leaks of hexone and hydrocarbons have occurred due to puncturing of drums by forklifts or from overflow of tanks.
- Paint solvents and paints containing lead, mercury, and chromium have been discarded to soil.
- Condensate and cooling water that contained chemical and radionuclide contaminants were discharged to injection wells.
- Structures have been erected over several known waste sites. Although the hazardous material is still in place at these locations, there is no evidence of any resultant hazard.
- Because these leaks, spills, and discharges create the potential for future exposure to workers during construction, decontamination and decommissioning, and other activities that disturb the soil, WINCO has taken several important steps to mitigate that hazard. An attempt was made in 1985 to catalog all known sites where hazardous materials may have leaked to soil. Historical records were searched, and older employees were asked to recall leak events from memory. Procedures are now in effect that specify required actions in the event of a spill or the discovery of an old leak site.

Site/Facility:	Idaho National Engineering Laboratory
Vulnerability Number:	CSVR-INEL-CH-01
Functional Area(s):	Identification of Chemical Holdings

4. Supporting Observations. (Continued)

- All accessible leak sites have been investigated to some degree. Some of the known waste sites have been characterized by digging and sampling, and a network of wells has been installed to monitor for hazardous and radioactive materials.
- Some leak sites have been remediated or have been determined to require no action under applicable regulations. Regulatory agencies have been involved as appropriate.
- There are 83 units (locations) listed in the WINCO Environmental Restoration Project. Many of these units received discharges other than hazardous materials. The units are grouped geographically into Environmentally Controlled Areas that are posted to protect the health and safety of workers.

CHEMICAL SAFETY VULNERABILITY REVIEW
VULNERABILITY FORM DATE: May 10, 1994

Site/Facility:	Idaho National Engineering Laboratory/Sitewide
Vulnerability Number:	CSVR-INEL-CH-02
Functional Area(s):	Identification of Chemical Holdings, Operational Control and Management Systems

1. Brief Description of Vulnerability.

   Delays in disposition of hazardous materials and wastes.

2. Summary of Vulnerability.

   Hazardous materials and wastes have been stored for extended periods of time at the INEL without provision for their final disposition. Two examples of materials needing disposition are the primary coolant fluid in the tank farm at the Idaho Chemical Processing Plant (ICPP) that contains dichromate and the hexone solvent extractant contaminated with fission products in Building CPP-601. An example of a characteristic hazardous waste needing disposition is the sodium-potassium mixed waste stored at the Army Reentry Vehicle Facility Site (ARVFS).

3. Basis.

   a. Requirements: IDAPA 16.01.05 specifies Idaho Rules, Regulations, and Standards for identification of and treatment, storage, and disposal of hazardous waste.

   b. Chemicals Involved:
      - Hexone solvent extractant (contaminated with fission products)
      - Potassium dichromate
      - Sodium-potassium alloy (contaminated with fission products)

   c. Relevant Self-Evaluation Data: In the self-evaluation, the site discusses the personnel protection provided by the closed system in which the dichromate solution is used. The site further states that efforts are being made to remove and treat the sodium-potassium.

   d. Contributing Causes:
      - Formal policies for the use or disposal of excess chemicals have not been developed.
      - Adequate resources not provided.
      - No facility in the country currently has the capability to treat the sodium-potassium.

   e. Potential Consequences: The most likely environmental impacts would be localized spills or fission products release that could involve reportable quantities, although offsite migration could also occur. Residual environmental risks or liabilities could result. Injuries and other impacts to worker safety and health would likely be localized. These conditions and circumstances represent a medium-priority vulnerability with a potential for medium-term consequences.

Site/Facility:	Idaho National Engineering Laboratory/Sitewide
Vulnerability Number:	CSVR-INEL-CH-02
Functional Area(s):	Identification of Chemical Holdings, Operational Control and Management Systems

4. Supporting Observations.

- About 10,000 gallons of cooling water containing about 500 parts per million of dichromate is being stored in two above-ground tanks and in piping and cooling coils in the radioactive waste tanks in the tank farm. There is currently no strategy to dispose of this nonradioactive material other than to leave it in place until the tank farm is retired in 10–20 years. Cooling has not been needed since 1988, and cooling will not be required until possibly during removal of heels from the tanks beginning in 5–10 years. Since the nonradioactive material is not needed for such a long period, it should be removed from the surge tanks and treated. It may be necessary, however, to keep a solution inside the cooling coils to maintain a higher hydraulic pressure on the nonradioactive side of the coil as long as there is waste in the tanks.

  In addition, the filled surge tanks do not have any secondary containment and have a design that would not meet good management practices today. The floor drains under the surge tanks were plugged 3 years ago, but any large spills would flow out the doors of Building CPP-628. There are also thermometers penetrating the tank walls near the bottom of the tanks, and there are sample and drain lines that could not be isolated if the small-diameter lines leaked or ruptured.

- Reclaimed hexone solvent extractant (about 1,000 gallons) is being held in cell tankage in Building CPP-601. The material is contaminated with fission products. It is still classified as a process material but may eventually be declared a radioactive waste. WINCO has tentative plans to transport this material to a commercial incinerator licensed to burn combustible materials with fission products.

- The ARVFS bunker contains four containers of sodium-potassium mixed waste that have been stored since 1974. Two of the containers are 55-gallon stainless-steel drums, and two carbon-steel containers are 60-gallon and 10-gallon drums. All containers are stored in a metal bin with vermiculite. During the last visual inspection of the four containers in 1979, the two carbon steel containers showed external corrosion. Another 15 years has passed since this last inspection, and the condition of the carbon steel containers is unknown. If the containers are leaking or allowing air to contact the sodium-potassium mixed waste, a potentially unstable mixture could result.

  The INEL has attempted to have the wastes removed and treated with little success. First, the site attempted to develop a process to react the sodium-potassium with chlorine gas to form sodium chloride and potassium chloride. However, this effort was abandoned because of feasibility problems. The site then issued a Request for Proposal soliciting private-sector packaging, transportation, and treatment, but this effort also failed because of a lack of responsive proposals. Within the past week, DOE Chicago Operations Office and the DOE Idaho Operations Office have met with the Idaho Department of Environmental Quality to pursue treatment of the sodium-potassium waste from ARVFS in the Sodium Components Maintenance Shop at ANL-W. The plan is to treat the waste to produce a sodium carbonate/potassium carbonate radioactive waste that can be transported to the Radioactive Waste Management Complex.

  The ARVFS is only an interim status storage facility for hazardous waste, and the condition of the waste containers and waste will not improve with passing time.

CHEMICAL SAFETY VULNERABILITY REVIEW
VULNERABILITY FORM

DATE: May 10, 1994

Site/Facility:	Idaho National Engineering Laboratory/Sitewide
Vulnerability Number:	CSVR-INEL-EMP-01
Functional Area(s):	Emergency Management Programs

1. Brief Description of Vulnerability.

   Weaknesses in the INEL emergency management programs documentation.

2. Summary of Vulnerability.

   Although the Idaho National Engineering Laboratory/West Valley Demonstration Project Emergency Plan's stated purpose is to ensure consistent, integrated, and controlled emergency response actions for any operational emergency (this includes a hazardous materials event), it is not currently supported by emergency plan implementing procedures (EPIPs) as required by DOE 5500.3A. Emergency action levels (EALs) for hazardous chemical events are inconsistent among contractors, are missing in the INEL Emergency Plan, and some hazardous material (HAZMAT) EALs are inconsistent between a contractor's plan and the contractor's own EPIPs. Because of these inadequacies in program documentation, an emergency response to a hazardous material incident could be less than optimum.

3. Basis.

   a. Requirements:

      - DOE 5500.3A, Sections 9e and 11d(2), requires EPIPs to implement emergency plans.
      - DOE 5500.3A, Section 11c(3), requires that EALs be developed for recognizing and classifying emergency events and form the basis for notification and determination of what protective actions will be implemented and when.
      - DOE 5500.1B defines emergency response planning guides (ERPGs).
      - DOE 5500.2B, Section 5b, requires the use of ERPGs where developed and applicable. (Note: ERPGs are defined as three different levels, ERPG-1, ERPG-2, ERPG-3.)

   b. Chemicals Involved: All hazardous chemicals at the INEL.

   c. Relevant Self-Evaluation Data: The INEL self-evaluation did not identify the need to update out-of-date and inconsistent documentation as an environment, safety, and health concern requiring immediate attention; and the ANL-W self-evaluation did not identify the need to support the current incident command system with appropriate documentation and procedures.

   d. Contributing Causes:

      - Incomplete implementation of identified requirements.
      - Sufficient attention and resources have not been applied to development of plans and procedures.
      - Inconsistent examples of definitions of "emergency" in DOE 5500.1B and DOE 5000.3B, Section 7.1(1).

Site/Facility:	Idaho National Engineering Laboratory/Sitewide
Vulnerability Number:	CSVR-INEL-EMP-01
Functional Area(s):	Emergency Management Programs

3. Basis. (Continued)

- Incomplete guidance on EAL criteria from DOE Headquarters.
- Lack of formal policy on INEL sitewide emergency management issues from the Idaho Operations Office.

e. Potential Consequences: Adequate implementation of the sitewide emergency plan for response to an actual emergency is not ensured without procedures. INEL Emergency Plan response would likely be accomplished on an ad hoc basis. Adequate implementation of the incident command system is not ensured without procedures. Adequate classification of an emergency and implementation of correct protective actions is not ensured without consistent and correct EALs and emergency classification categories. The above four potential consequences have the potential to increase the risk to workers and responders in a HAZMAT event. These conditions and circumstances represent a medium-priority vulnerability with a potential for immediate consequences.

4. Supporting Observations.

- Review of available INEL documentation identified facility-specific and responder-specific emergency response plans and procedures, but no sitewide EPIPs. Discussions with EG&G Idaho indicated that EPIPs do not exist for the *Idaho National Engineering Laboratory/West Valley Demonstration Project Emergency Plan* and EALs are not included in the plan.

  EALs are the specific indicators used to determine occurrence category and emergency classes. The category of emergency (based on severity) drives the level of activation and most likely indicates that some form of protective action may need to be taken onsite or offsite. The level of activation often drives the level of initial resources to respond to and mitigate an event. If the level of initial response is incorrect, an event could escalate.

- The *Idaho Chemical Processing Plant Emergency Plan* establishes release of nonradiological hazardous material EALs to be greater than ERPG-2 values at locations within the ICPP, outside the ICPP, and beyond the INEL boundary to establish Alert, Site Area Emergency, and General Emergency classifications, respectfully. This approach appears to be logical.

- At least one ICPP facility reviewed appears to contain a chemical source term sufficient to result in an emergency with impact beyond the respective ICPP boundary.

- *The Waste Reduction Operations Complex/Waste Experimental Reduction Facility/Power Burst Facility Emergency Plan Implementing Procedures Manual* and *Radioactive Waste Management Complex Emergency Plan Implementing Procedures Manual* use greater than ERPG values or greater than protective action guides generically at the same locations as WINCO, but they do not specify which level of ERPG must be exceeded to classify. Conversely, the *Environmental Restoration and Waste Management Emergency Plan/Resource Conservation and Recovery Act Contingency Plan* for the Power Burst Facility provides only an interim descriptive occurrence EAL to classify an event and does not address a parametric ERPG level. The document states that hazards assessments, including EALs, are under development.

Site/Facility:	Idaho National Engineering Laboratory/Sitewide
Vulnerability Number:	CSVR-INEL-EMP-01
Functional Area(s):	Emergency Management Programs

4. Supporting Observations. (Continued)

- Section II of ANL-W's *Guidelines Appendices for ANL-W Site and Facility Emergency Plans and Procedures* provides the following:
  - For a toxic/flammable radioactive release onsite, the size/type of spill requires implementation of the Department of Transportation Emergency Response Guidebook protective actions; and
  - The detection of airborne flammable material requires an EAL greater than ERPG-3 (or 10 percent of the lower explosive limit (LEL), or 10 percent of the immediately Dangerous to Life or Health Limit), with an "Alert" classification.

- Conversely, the *ANL-W Emergency Handbook*, Volume II, which includes the "Laboratory and Office Buildings (752) Emergency Plan and Procedures," Table III, provides the following:
  - For a toxic or flammable gas release within the Analytical Laboratory, the EAL is defined for an uncontrolled release of an inert gas, with an "Unusual Event" (UE) classification; and
  - The EAL is also defined for an uncontrolled release of a flammable gas (e.g., H_2, propane, methane) within the Analytical Laboratory with an "Alert" classification.

  Besides being contradictory, these EALs do not address a toxic gas release and the UE classification is no longer a valid emergency classification level.

- ANL-W has implemented the incident command system methodology, but has not completed development of plan and supporting EPIPs. To ANL-W's credit, procedures are in the developmental stage and are nearing completion.

- It was reported and documented that a joint contractor Technical Support, Integration, and Assessment Subcommittee was established by the INEL Emergency Planning Coordinating Committee to facilitate sharing technical information relative to emergency planning issues. The EG&G Idaho Emergency Management Unit has also generated and distributed ERPG guidance on developing EALs to the INEL contractors.

ATTACHMENT 3

SELECTED ACRONYMS

AAO-W	Argonne Area Office-West
AL	DOE Albuquerque Operations Office
ANL-W	Argonne National Laboratory-West
ARVFS	Army Reentry Vehicle Facility Site
ATR	Advanced Test Reactor
B&W	Babcock & Wilcox
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFA	Central Facilities Area
D&D	Decontamination and Decommissioning
DOE	U.S. Department of Energy
EAL	Emergency Action Level
EBR-II	Experimental Breeder Reactor II
ECC	Emergency Control Center
EOC	Emergency Operations Center
EPIP	Emergency Plan Implementing Procedure
ERPG	Emergency Response Planning Guide
FAST	Fluorinel Dissolution Process and Fuel Storage (Facility)
HAZCOM	Hazard Communication
HAZMAT	Hazardous Material
ICPP	Idaho Chemical Processing Plant
ID	DOE Idaho Operations Office
INEL	Idaho National Engineering Laboratory
IRT	Incident Response Team
MK-FIC	Morrison Knudsen-Ferguson of Idaho Company
MSDS	Material Safety Data Sheet
M&O	Management and Operating
OCAW	Oil, Chemical, and Atomic Workers
OSHA	Occupational Safety and Health Administration/Act
PBF	Power Burst Facility
PPE	Personal Protective Equipment
PTI	Protection Technology Idaho

SELECTED ACRONYMS (Continued)

RADCON	Radiological Control
RCRA	Resource Conservation and Recovery Act
RESL	Radiological and Environmental Sciences Laboratory
RSSF	Radioactive Sodium Storage Facility
RSWF	Radioactive Scrap and Waste Facility
RWMC	Radioactive Waste Management Complex
TAN	Test Area North
TRA	Test Reactor Area
TQM	Totally Quality Management
UE	Unusual Event
WCC	Warning Communications Center
WERF	Waste Experimental Reduction Facility
WINCO	Westinghouse Idaho Nuclear Company, Incorporated